CITY OF CULDESAC (PWS 2350003)
SOURCE WATER ASSESSMENT FINAL REPORT

February 5, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for City of Culdesac, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The City of Culdesac drinking water system consists of two wells: Well #1 Lower and Well #2 Upper. Both wells rated high susceptibility to inorganic, volatile organic, synthetic organic, and microbial contaminants. With moderate to well-drained soils, fractured rock, and limited well log information, coupled with sanitary recommendations, the system rates high despite the limited number of potential contaminant sources. Well #2 Upper has potential contaminant sources located within the 50-foot radius sanitary setback. Bringing both wells into compliance with the well seal and surface flooding protection sanitary regulations, as well as removing potential contaminants within the 50-foot radius, could reduce some of the ratings from high to moderate. Additional well drillers information could also help lower the overall scores.

There are no current significant water quality issues with the system. Total coliform bacteria have been detected in August and November 1993, October 1996, July and December 1997, and June and July 1998, in the distribution system at various locations throughout the City of Culdesac. These numerous detections could signal a possible contamination problem. Previous sanitary information (DEQ, 1993; DEQ, 2001) identifies the areas of the wellheads as being primary candidates for surface contamination. No synthetic organic contaminants have ever been detected. Well #2 Upper showed a detection of chloroform in March 2001. This disinfection by-product is not considered to be a problem with the source water. The inorganic contaminants cadmium and fluoride have been detected, but at levels below the current maximum contaminant levels (MCLs) as set by the EPA. Nitrate has been detected in Well #1 Lower at levels ranging from 1.57 milligrams per liter (mg/L) in March 2001 to 7.51 mg/L in April 1997. The MCL for nitrate is 10 mg/L. Nitrate levels in Well #2 Upper have been consistently less than 2.9 mg/L. Though there have not been significant water quality problems with the system water, the City of Culdesac should be aware that the potential for contamination from the aquifer still exists.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Culdesac system, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Also, the chlorine disinfection system should be carefully monitored to prevent further introduction of disinfection by-products into the drinking water supply. Though water cannot be totally free of by-products when disinfection is used, they can be reduced by treatment modifications. For other disinfection by-product control strategies, see http://www.epa.gov/safewater/mdbp/pdf/alter/chapt_2.pdf.

No chemicals should be stored or applied within the 50-foot radius of the wellheads, including, but not limited to, the wheat field and propane tank located within 50 feet of Well #2 Upper. A contingency plan should be established to deal with any contamination and possible spills from Lapwai Creek, the Union Pacific Railroad, and Highway 95. As much of the designated protection areas are outside the direct jurisdiction of the City of Culdesac, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations encompass much urban and commercial land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there is a major transportation corridor through the delineation (Highway 95), the Idaho Department of Transportation should be involved in protection activities. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Lewiston Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF CULDESAC, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The local community, based on its own needs and limitations, should determine the decision as to the amount and types of information necessary to develop a drinking water protection program. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for the City of Culdesac is comprised of two ground water wells that serve approximately 485 people through approximately 207 connections. The wells are located in Nez Perce County, to the north and east of the City of Culdesac (Figure 1).

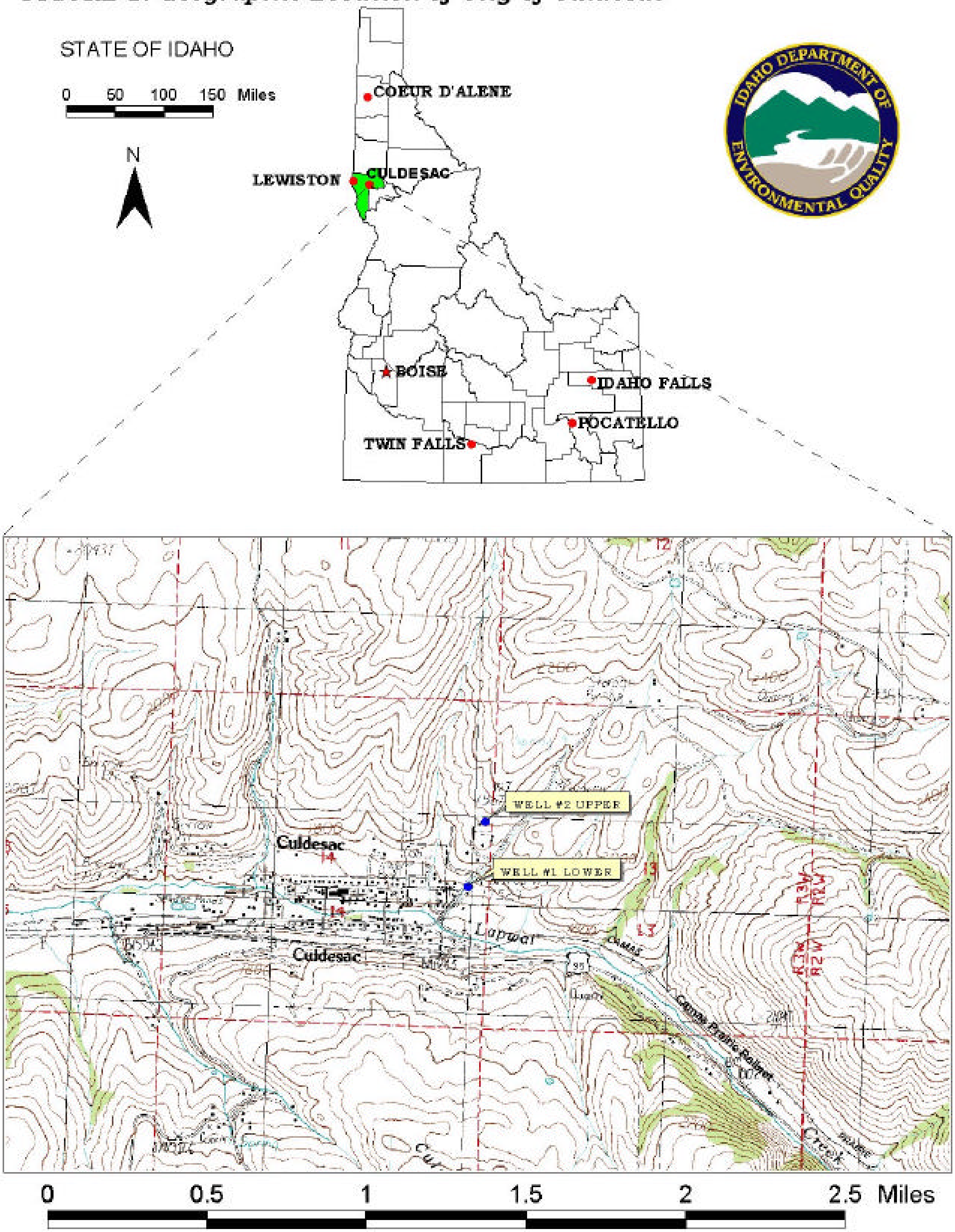
There are no current significant water quality issues with the system. Total coliform bacteria have been detected in August and November 1993, October 1996, July and December 1997, and June and July 1998, in the distribution system at various locations throughout the City of Culdesac. These numerous detections could signal a possible contamination problem. Previous sanitary information (DEQ, 1993; DEQ, 2001) identifies the areas of the wellheads as being primary candidates for surface contamination. No synthetic organic contaminants (SOCs) have ever been detected. Well #2 Upper showed a detection of the volatile organic contaminant (VOC) chloroform in March 2001. This disinfection by-product is not considered to be a problem with the source water. The inorganic contaminants (IOCs) cadmium and fluoride have been detected, but at levels below the current maximum contaminant levels (MCLs) as set by the EPA. Nitrate has been detected in Well #1 Lower at levels ranging from 1.57 milligrams per liter (mg/L) in March 2001 to 7.51 mg/L in April 1997. The MCL for nitrate is 10 mg/L. Nitrate levels in Well #2 Upper have been consistently less than 2.9 mg/L.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with the University of Idaho to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Grande Ronde aquifer of the Clearwater Plateau in the vicinity of the City of Culdesac wells. The computer model used site specific data, assimilated by the University of Idaho from a variety of sources including the City of Culdesac well log and operator input, local area well logs, and hydrogeologic reports (detailed below).

The Grande Ronde Formation of the Columbia River Basalt Flows provides most of the ground water pumped in the vicinity of Culdesac because of its great thickness, extensive lateral continuity, and lack of fine-grained interbeds. At Culdesac, the Grande Ronde Formation is exposed at the surface. The Grande Ronde is easily accessible to drilling along parts of the Clearwater River and some of the tributary valleys such as Lapwai Creek where it has been exposed by erosion (Crosthwaite, 1989). Both the Culdesac #1 Lower and #2 Upper Wells are assumed for this study to be in the Grande Ronde, based on their production (150 and 140 gallons per minute (gpm) respectively) and geologic maps of the area (Rember and Kauffman, 1993).

FIGURE 1. Geographic Location of City of Culdesac



The Grande Ronde aquifer at Culdesac is barely within the assumed boundary of “Lewiston Aquifer” (EPA, 1988), also referred to as the “Lewiston Basin Deep Aquifer” (Wyatt-Jaykim, 1994), which was modeled in this study as a no-flow boundary for other communities, such as Lapwai and Lewiston. The portion of that assumed no-flow boundary closest to Culdesac is the Limekiln Fault, and there are no data to indicate whether the fault has a no-flow effect on the basalts at Culdesac.

Within the Grande Ronde basalts north of the Limekiln fault, water is generally assumed to flow from recharge in the highlands (see section on recharge below) to discharge into the Snake and Clearwater Rivers.

Culdesac is located directly on the banks of Lapwai Creek, as are the source wells. Lapwai Creek at Culdesac flows directly on the surface of the Grande Ronde basalts, and the source wells are completed in the Grande Ronde. It is not known whether the creek recharges the aquifer, or vice versa. It is possible that flow moves either way, depending upon the time of the year. Ground water chemistry data at Lapwai is interpreted in Wyatt-Jaykim (1994) to mean that the ground water there is relatively young and therefore in a recharge area; this interpretation is even more relevant at Culdesac because the Grande Ronde is in direct connection with the creek.

Vertical recharge into the Grande Ronde is assumed to exist at Culdesac because the basalts are exposed at Culdesac. Precipitation is 13 inches/year in Lewiston-Clarkston, whereas higher elevation areas average close to 25 inches annually (Cohen and Ralston, 1980). A modeling effort documented by Wyatt-Jaykim (1994), concluded on the basis of available data that 1 to 2 inches/year is a conservative estimate for recharge to the basalt aquifers in the vicinity of Lewiston and Lewiston Orchards.

The capture zones delineated herein are based upon limited data and must be taken as best estimates. If more data become available in the future these delineations should be adjusted based on additional modeling incorporating the new data.

The delineated source water assessment area for the City of Culdesac Well #1 Lower can best be described as an ellipsoid that stretches to the south and southeast of the wellhead (Figure 2). The delineated source water assessment area for Well #2 Upper extends to the south and then follows Lapwai Creek upstream to the southeast. Due to limited data available, the 6-year and 10-year TOTs are combined for Well #2 Upper (Figure 3). The actual data used by the University of Idaho in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of the City of Culdesac wells consists of urban, residential, and a major transportation corridor (Highway 95), while the surrounding area is predominantly undeveloped.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in October and November 2001. The first phase involved identifying and documenting potential contaminant sources within the City of Culdesac source water assessment areas (Figures 2 & 3) through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

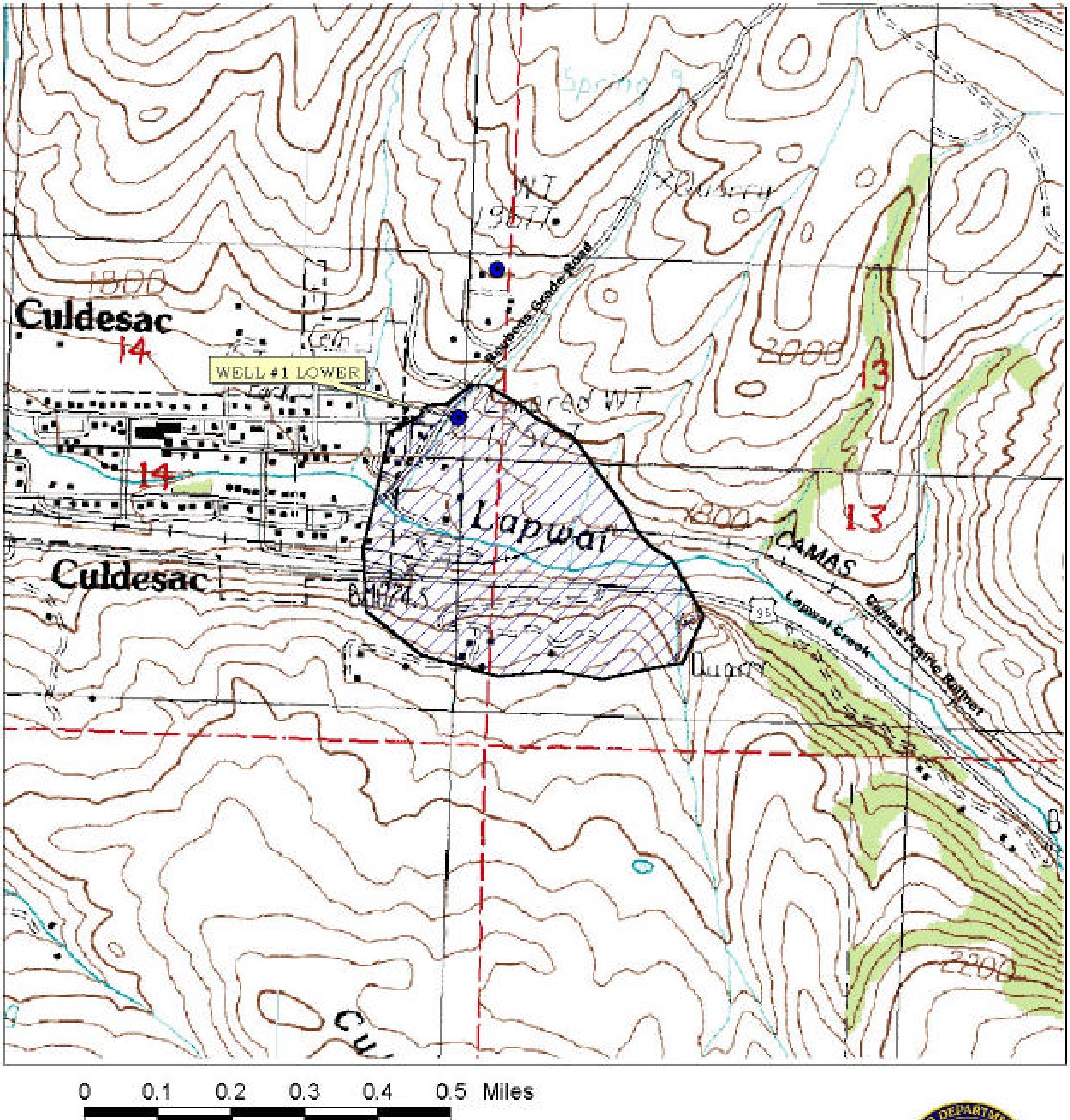
The Well #1 Lower delineation and the Well #2 Upper delineation (Figures 2 & 3, Table 1) contain two major transportation corridors (Highway 95 & the Union Pacific Railroad) and Lapwai Creek as potential contaminant sources. The system should be aware that a spill on the section of Highway 95 contained within the delineations has a chance to contribute all classes of contamination to the aquifer.

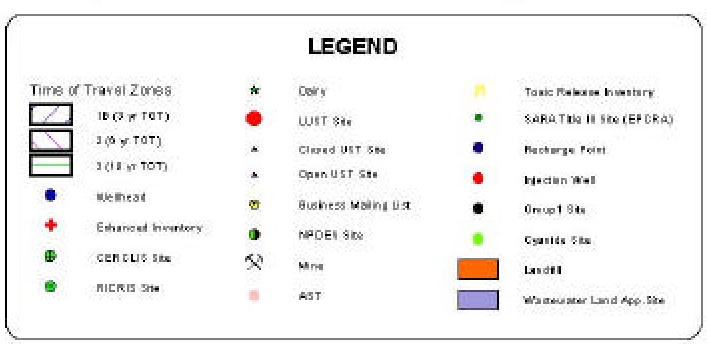
Table 1. City of Culdesac Well #1 Lower and Well #2 Upper, Potential Contaminant Inventory

Site #	Source Description[1]	TOT ZONE[2]	Source of Information	Potential Contaminants[3]
	Highway 95	0-10	GIS Map	IOC, VOC, SOC, Microbes
	Lapwai Creek	0-10	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railraod	0-10	GIS Map	IOC, VOC, SOC, Microbes

[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 2. City of Culdesac Delineation Map and Potential Contaminant Source Locations





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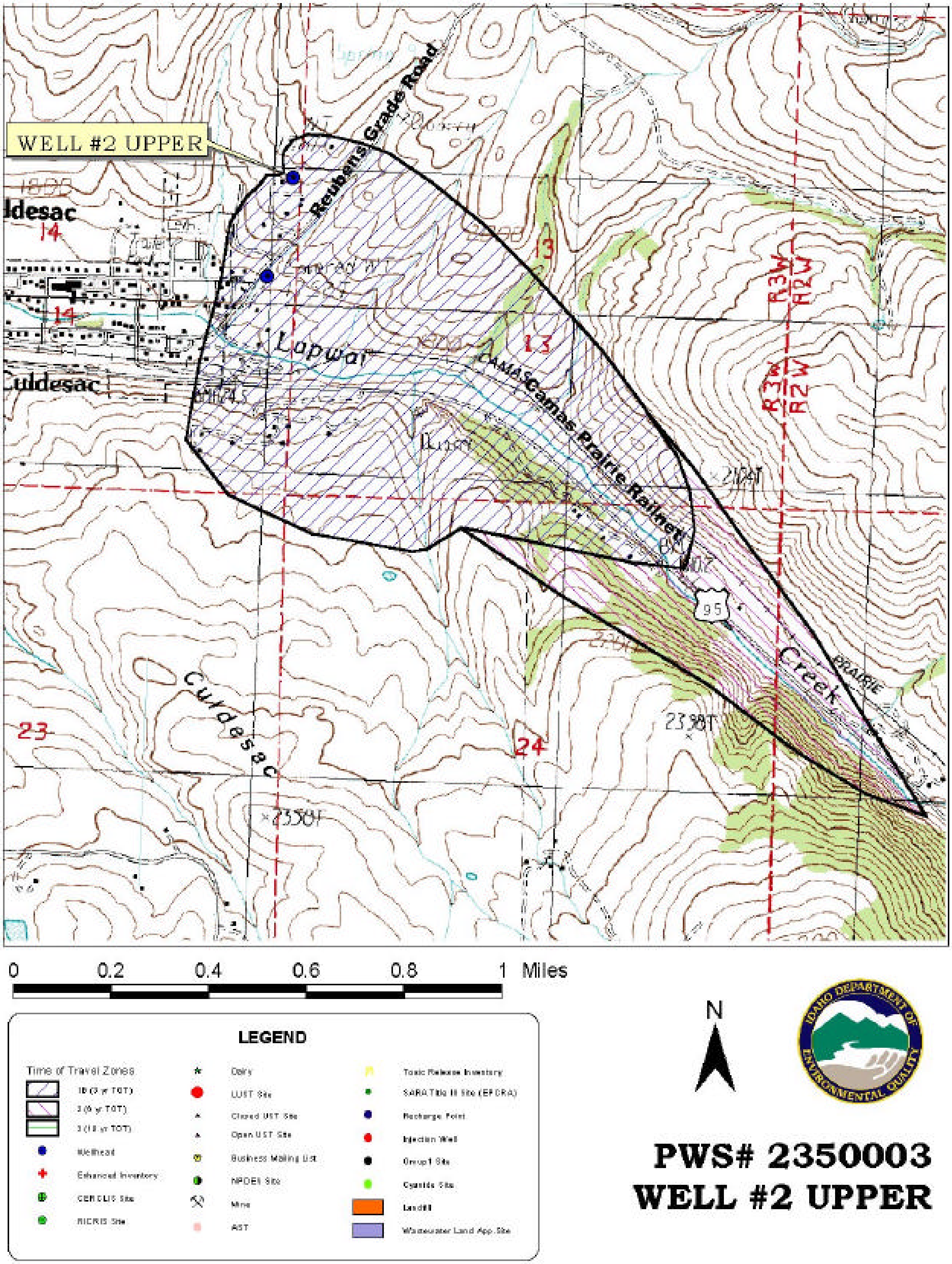
WELL #1 LOWER

Figure 3. City of Culdesac Delineation Map and Potential Contaminant Source Locations



Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity is high for both wells (Table 2). Regional soil data places the delineations within moderate to well drained soils. The vadose zone is clay and basalt and the water table is located at about 150 feet below ground surface (bgs) in some nearby wells. There was insufficient well log information to determine if adequately thick low permeability layers existed in the area of the wells.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced. A sanitary survey was conducted in 2001. Both wells have a high system construction score. The sanitary survey (DEQ, 2001) recommendations include raising the wellheads out of the pits and constructing wellheads to comply with IDAPA 59.01.08.550.03.1.

Well #1 Lower, drilled in 1934 to a depth of 448 feet, has 10-inch casing that terminates 12 inches above the concrete floor of a 3 foot deep well pit. The floor of the pit is drained. No well log was available to allow a determination of the placement of the annular seal. The static water table was measured at 210 feet bgs in the 1970s, but hasn't been measured recently. This well supplies approximately 25% of the city drinking water. Current use is at a level of 120 gpm. The sanitary survey (DEQ, 2001) indicates that the system may not be protected from surface flooding.

Well #2 Upper, drilled in 1974 to a depth of 555 feet, has 0.250-inch thick, 10-inch casing to 60 feet bgs, 0.250-inch thick, 8-inch casing to 220 feet bgs, and 0.287-inch thick, 6.5-inch casing from 180 to 420 feet bgs. The casing terminated in a well pit that is 6 feet deep. The exterior end of the floor drain could not be located. The well log indicates that the annular seal was placed to 60 feet bgs into "boulders and clay." The static water table was measured at 398 feet bgs in the 1974, but hasn't been measured recently. This well supplies approximately 75% of the city drinking water. Current use is at a level of 160 gpm. The sanitary survey (DEQ, 2001) indicates that the system may not be protected from surface flooding.

A determination was made as to whether current public water system (PWS) construction standards are being met. Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Six-inch diameter wells require a casing thickness of at least 0.280-inches and 8-inch diameter casing requires 0.322-inch thick casing. The wells were assessed an additional point in the system construction rating.

Potential Contaminant Source and Land Use

As the delineations contain the same potential contaminant sources, the land use scores are similar as well. Both wells rated moderate land use for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products, chlorinated solvents), and SOCs (i.e. pesticides), and rated low land use for microbial contaminants (i.e. bacteria). The presence of Highway 95, the Union Pacific Railroad, and Lapwai Creek influenced the scores the most as these sources could contribute all classes of contamination in the unlikely event of a spill.

Final Susceptibility Ranking

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. In this case, there is a wheat field located 30 feet to the north of Well #2 Upper and an adjoining home's propane tank lies within the 50-foot sanitary setback. These potential contaminant sources cause Well #2 Upper to automatically rate high susceptibility to IOCs, VOCs, SOCs, and microbial contaminants. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both wells rate high for all classes of contaminants.

Table 2. Summary of City of Culdesac Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
#1 Lower	H	M	M	M	L	H	H	H	H	H
#2 Upper	H	M	M	M	L	H	H*[2]	H*	H*	H*

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[2]H* = Automatically rated high due to wheat field within 50 feet of the wellhead

Susceptibility Summary

Overall, both wells rate high for all classes of contaminants. With moderate to well-drained soils, fractured rock, and limited well log information, coupled with sanitary recommendations, the system rates high despite the limited number of potential contaminant sources. Well #2 Upper has potential contaminant sources located within the 50-foot radius sanitary setback. By bringing both wells into compliance with the well seal and surface flooding protection sanitary regulations, as well as removing potential contaminants within the 50-foot radius, could reduce some of the ratings from high to moderate. Additional well drillers information could also help lower the overall scores.

There are no current significant water quality issues with the system. Total coliform bacteria have been detected in August and November 1993, October 1996, July and December 1997, and June and July 1998, in the distribution system at various locations throughout the City of Culdesac. These numerous detections could signal a possible contamination problem. Previous sanitary information (DEQ, 1993; DEQ, 2001) identifies the areas of the wellheads as being primary candidates for surface contamination. No SOCs have ever been detected. Well #2 Upper showed a detection of the VOC chloroform in March 2001. This disinfection by-product is not considered to be a problem with the source water. The IOCs cadmium and fluoride have been detected, but at levels below the current MCLs as set by the EPA. Nitrate has been detected in Well #1 Lower at levels ranging from 1.57 mg/L in March 2001 to 7.51 mg/L in April 1997. The MCL for nitrate is 10 mg/L. Nitrate levels in Well #2 Upper have been consistently less than 2.9 mg/L.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the City of Culdesac system, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. Also, the chlorine disinfection system should be carefully monitored to prevent further introduction of disinfection by-products into the drinking water supply. Though water cannot be totally free of by-products when disinfection is used, they can be reduced by treatment modifications. In 1983, EPA identified some technologies, treatment techniques and plant modifications that water systems could use to reduce the amount of disinfection by-products produced. One of the most effective and simple treatment modifications was to move the point of chlorination downstream in the treatment train thereby reducing the amount of natural organic matter (NOM) in the source water. NOM, a disinfection by-product precursor, reacts with free chlorine, free bromine, or oxidizing agents to form disinfection by-products. Other factors that affect the formation of by-products are pH, temperature, and dose of disinfection. For other disinfection by-product control strategies, see http://www.epa.gov/safewater/mdbp/pdf/alter/chapt_2.pdf.

No chemicals should be stored or applied within the 50-foot radius of the wellheads, including, but not limited to, the wheat field and propane tank located within 50 feet of Well #2 Upper. A contingency plan should be established to deal with any contamination and possible spills from Lapwai Creek, the Union Pacific Railroad, and Highway 95. As much of the designated protection areas are outside the direct jurisdiction of the City of Culdesac, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

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A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Lewiston Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Lewiston Regional DEQ Office	(208) 799-4370
State DEQ Office	(208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

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Attachment A

City of Culdesac Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.273) – for Well #1 Lower

2) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2) – for Well #2 Upper

3) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : CULDESAC CITY OF   Well# : WELL #1 LOWER

Public Water System Number 2350003   01/17/2002 7:15:19 AM

1. System Construction		SCORE			
Drill Date	01/01/1934				
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES	1989			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	NO	1			
	Total System Construction Score	6			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	0	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	0	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	3	3	3
(Score = # Sources X 2) 8 Points Maximum		6	6	6	6
Sources of Class II or III leacheable contaminants or	YES	3	3	3	
4 Points Maximum		3	3	3	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
	Total Potential Contaminant Source / Land Use Score - Zone 1B	11	9	9	6
Cumulative Potential Contaminant / Land Use Score		11	9	11	6
4. Final Susceptibility Source Score		15	14	15	14
5. Final Well Ranking		High	High	High	High

Ground Water Susceptibility Report

Public Water System Name : CULDESAC CITY OF

Well# : WELL #2 UPPER

Public Water System Number 2350003

01/17/2002 7:18:03 AM

1. System Construction		SCORE			
Drill Date	05/15/1974				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1989			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	NO	1			
	Total System Construction Score	6			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE	1	1	1	1
Farm chemical use high	YES	0	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
	Total Potential Contaminant Source/Land Use Score - Zone 1A	1	1	3	1
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	3	3	3
(Score = # Sources X 2) 8 Points Maximum		6	6	6	6
Sources of Class II or III leacheable contaminants or	YES	5	3	3	
4 Points Maximum		4	3	3	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	25 to 50% Non-Irrigated Agricultural Land	1	1	1	1
	Total Potential Contaminant Source / Land Use Score - Zone 1B	13	10	10	7
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
	Potential Contaminant Source / Land Use Score - Zone II	3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III	2	2	2	0
Cumulative Potential Contaminant / Land Use Score		19	16	18	8
4. Final Susceptibility Source Score		16	15	16	15
5. Final Well Ranking		High	High	High	High